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Interactive Planning

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Introduction

Interactive planning rests on the premise that despite the nature of their environment, organizations are usually affected by a host of interrelated problems, few of which can be solved in isolation [1,2]. Organizations that use interactive planning, normally, experience improved performance and accelerated development [3]. Interactive planning is the brainchild of Russell L. Ackoff. Ackoff, often called the father of operations research, had a distinguished career in operational research (OR) both as an academic and practitioner [4]. His influence on the early development of the discipline both in the U.S. and Britain in the 1950s and 1960s is hard to overstate. Interactive planning, an evocatively innovative process, engages a carefully selected group of stakeholders (requisite minds) in a facilitated creative (re) design effort [5,6].

Within the constructs of interactive planning, problems are no longer discrete, and that they do not occur in additive sets that can be disaggregated. Instead, they are systems of problems, termed by Ackoff as ‘messes.’ [7,8]. Notwithstanding his pioneering role in OR, by the 1970s Ackoff’s disillusionment with its technique-dominated focus was evident. Ackoff had come to realize the inherent inadequacy of OR’s traditional paradigm; it relies on existing knowledge -- knowledge gained by studying traditional approaches. Instead, Ackoff advocated more participative approaches. “These criticisms have had limited resonance within the USA, but were picked up both in Britain, where they helped to stimulate the growth of Problem Structuring Methods and in the systems community world-wide.” [9]

The essence of Ackoff’s philosophical turn is this: the creative way to approach a "mess" is not to tackle the problems individually and try to solve them separately. Such solutions are generally short-lived when successful, and very often unsuccessful long term because each of these solutions creates new problems which stand in the way of a solution to the others. This is the foundation of Interactive Planning. Interactive Planning displays a fundamental shift in the "worldview" toward a systemic vision of reality [1]. As Ramirez [10] suggested, problems, even as abstract mental constructs, do not exist in isolation, although we isolate them conceptually. Appraising the direction of human development and the contribution of the discipline he had founded, Ackoff did something unthinkable; at the pinnacle of his field, he opted to change course, charting a new way forward that has marked the path of systems theory for decades since [11].

Twenty years into a new century, traditional organizational forms, planning methodologies and response strategies are proving inadequate. Emerging conditions have increased volatility, increased uncertainty, increased complexity and increased ambiguity (VUCA world) [12]. Creating sustainable competitive advantage through innovation *became a centerpiece of* strategy development. Economies are increasingly knowledge-based and an organization’s value thus derived from their intellectual assets. As such, creating value through the engagement of all stakeholders is paramount. Creating business

opportunities and value using the knowledge that resides within individuals and organizations is what Interactive Planning is about.

Ackoff's shift away from traditional OR gave birth to Interactive Planning as a construct flexible enough to hold its value in a changing world [11]. This chapter presents the theoretical and methodological background of Interactive planning in detail, including the philosophy of idealized design. Systems thinking, which provides a useful starting point for understanding the methodological requirements of such an approach, is reviewed. Also, the three components of the systems approach to planning - treatment of an interactive problematical situation (mess), design as an approach to dealing with complex problems, and intervention and ways of bringing about the desired future -- are discussed in depth along with an explanation of the concept of organizational development.

Historical Development – From OR to Systems Thinking and Interactive Planning

No science is born on a specific day. Each emerges from a convergence of increased interest in some class of problems and development of scientific methods, techniques, and tools adequate to solve those problems. Operations Research is no exception. Its roots are as old as science and the management function, though its name dates back only to the 1940s. Although Operations Research began in a military context, its emergence and evolution paralleled the well-known development of industrial organizations that predated the modern era [13].

Before the industrial revolution most business and industry consisted of small enterprises, each directed by a single boss who did the purchasing, planned and supervised production, sold the product, and hired and fired personnel. Mechanization of production spurred the rapid growth of industrial enterprises making it impossible for one man to perform all these managerial functions. Consequently, a division of the management function took place. Managers of production, marketing, finance, and personnel appeared. Continued mechanization, supplemented in part by automation, fueled further industrial growth, propelling decentralization of operations and additional division of the management function. Production departments were subdivided into sections—maintenance, quality control, production planning, purchasing, stock—each supervised managerial figures.

OR's initial development began in the United Kingdom during World War II. After the war OR moved into business, industry, and civil government. This was the climate in which Russell Ackoff first explored systems management. Operations Research was Ackoff's starting point as an academic. However, "developing a purposeful approach to systems" was the thing that consumed his interest. [11] Ackoff was steeped in the intellectual traditions of architecture and philosophy, a background he shared with his mentor, C. West Churchman. Their self-defined mission was to set up an Institute of Experimental Method to apply philosophy to societal issues. To that end they established pioneering graduate programs in operations research. As collaborators, Ackoff and Churchman, together with E.L. Arnoff published OR's most influential early textbook, *Introduction to Operations Research,* in 1957. In it, Ackoff and his colleagues observed that problems arise if management responsibility is highly segmented. If operations research is used to identify the "best decisions relative to as large a portion of total organizations as possible, then it can help resolve this problem" [13].

Ackoff and his colleagues emphasized two critical characteristics of OR. First was increased differentiation and segmentation of the managerial function after 1900 and the corresponding emergence of a complex 'executive-type problems.' OR's purpose, to find "the best decisions relative to as large a portion of total organizations as possible", shaped its first principal characteristic: consistency with a systems approach. The second key element was the need for a team approach based upon an eclectic choice of disciplines. "Most man-machine systems have physical sociological, economic and engineering aspects," they asserted, "best understood by those trained in the appropriate fields" [13]. Ackoff believed that developing a plan for large industrial organizations that assumes everyone knows and can evaluate what everyone else does was futile. The inevitable division of functions, seen as the only workable solution, is the genesis of the executive-type problem. Instead, Ackoff and his colleagues recommended a highly refined balance of departmental objectives and overall objectives. "Over-all optimum," the ideal organizational planning outcome is a policy that takes account of the necessity of a split function in the organization [13].

Despite laudable achievements early in his career, Ackoff remained driven and curious. The evolving, technologically advancing world around him motivated Ackoff to rethink even his most fundamental works. After moving his group to the University of Pennsylvania in 1963, Ackoff and a small group of trusted colleagues began pushing OR in a different, more sophisticated direction. Published in 1968 and co-authored by Maurice Sasieni, *Fundamentals of Operations Research*, was Ackoff's manifesto that OR must jettison its overwhelmingly tactical orientation and engage with 'long-range strategic planning' issues. Ackoff and Sasieni [14] held that "the system being planned for is part of a dynamic environment" where "organizational performance is likely to deteriorate unless management intervenes...inside and outside the organization." The solution? A holistic approach built on conceptually oriented qualitative treatment of complex problems [14]. This is a core idea of systems thinking.

By the early 1970s Ackoff was disenchanted with intense analytical models applied to ever-reduced practical problems. He realized that numbers alone cannot describe reality and that measures are part of a management system and should support how managers make decisions. Ackoff registered increasing disillusion with the course and conduct of OR in trenchant prose such as "The Future of OR is Past", and "OR, a Post-Mortem." Ackoff understood that the challenge facing modern systems, particularly business systems, was segmentation and differentiation. For example, the production department generally seeks to minimize the cost of production and maximize production volume. The marketing department tries to minimize the cost of unit sales and maximize sales volume. The finance department attempts to optimize the capital investment policy of the business. The personnel department tries to hire and retain good people at minimum cost. These objectives are not always consistent; in fact, they frequently conflict with one another. When competing imperatives place the different appendages of a unified entity at odds, the result is a "mess." [4]

Take for instance an inventory problem common in modern industrial organizations. A company's production department is interested in reducing setup costs, though such reduction may increase inventories of certain products beyond the capacity of existing warehouses. Marketing wants immediate delivery over a wide variety of products, requiring a more diverse but still large inventory. Finance wants to minimize inventory because it wants to minimize capital investments that tie up assets for indeterminate periods. Personnel wants to stabilize labor and this can only be accomplished when goods are produced for inventory during slack periods. Rather than working toward a common goal, departments are now at cross purposes. What inventory policy is best for the organization as a whole?

This is an executive-type problem because (a) it involves the effectiveness of the organization as a whole, and (b) it involves a conflict of interests of the functional units of the organization. [13].

Ackoff's post-1970 embrace of participatory solutions pointed systems thinking toward a theoretical model designed to alleviate internal discord within organizations. He set the discipline on the path to Interactive Planning by straddling qualitative and quantitative methods in a groundbreaking fashion, kindling a new era in Operations Research and Systems Planning [15].

Theoretical Underpinning of Interactive Planning

Viewed structurally, a system is a divisible whole; viewed functionally it is an indivisible whole in the sense that some essential properties are lost when it is taken apart. The parts of a system may themselves be systems and every system may itself be part of a larger system. In the Systems Age we tend to look at things as part of a larger whole rather than as wholes to be taken apart. This is the doctrine of expansionism. Ackoff [16] proposed that expansionism brings with it a synthetic mode of thought much as reductionism brought with it the analytic mode. He contrasts producer-product (environment full theory of explanation) and indeterminism (probabilistic) with cause and effect and determinism. Expansionism, in essence, is the intellectual construct required to understand "messes."

Elaborating on the concept of the mess, Van Gigh [17] further defines an ill-structured problem as non-programmable, original, nonrepetitive, or not previously solved. "Its form probably does not fit the standard conditions of any well-known method of problem-solving" [17] As Warfield [18] asserts: "First, there must be an awakening to the existence of the complex problems as distinguished from normal problems." Within the social sciences emphasis is placed on developing methods to deal with ill-structured problems and at the same time to move the problems from one end of the scale (where only general problem-solving abilities are available) to the other (where some specific and more powerful methods are available). This differs from traditional problem-solving approaches which are based on a mechanistic paradigm. For example, universities are explained by their role in the educational system of which they are a part rather than the behavior of their parts, colleges and departments. This is contrary to reductionism (i.e., the belief that everything can be reduced to individual parts), analysis (as a way to understand a system), cause and effect (environment free theory of explanation) and determinism (fatalism). Well-structured problems can be solved with algorithms; ill-structured problems (messes) are amenable only to solutions by heuristics. Interactive planning and specifically idealized-design, successfully incorporate several philosophical and scientific principles that reveal the complexity of a 'mess' and serve as the basis for a comprehensive solution [3].

Philosophy of Idealized Design

The idealized design prioritizes the desired future of the organization. Earlier planning processes assumed the future of an organization was already set. Therefore, the most successful organization would be the one that responded best to its inevitable future state. These early planning methods attempted to predict the future. The idealized design rests on the opposite assumptions. To the degree that one can affect the future, it becomes less important to predict it. Hence prediction is replaced with design. To understand this planning method completely, it is necessary to examine the entire method of design and its relation to

the larger planning process of which it is a part. [3]

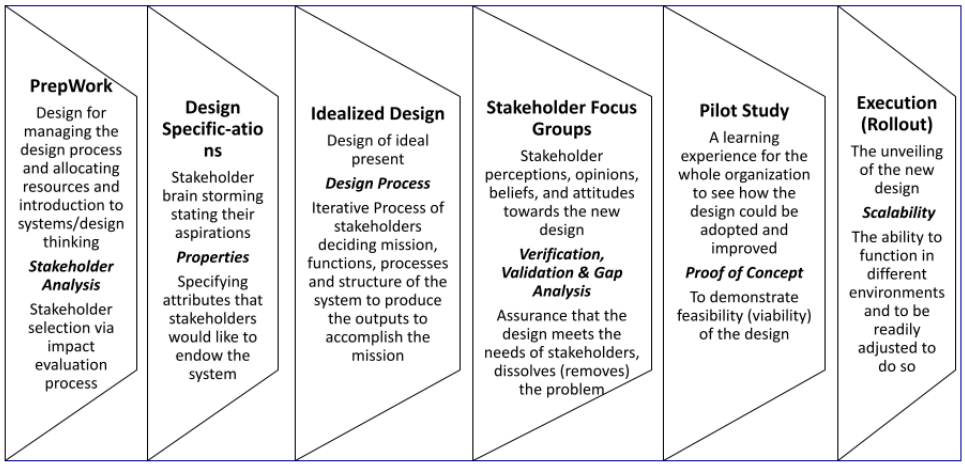
Systems thinking is based on three doctrines: expansionism, producer-product, and teleology [16]. Credit for recognizing the inner workings of these ideas belongs to the American pragmatist philosopher E.A. Singer, Jr. Prior to Singer, cause-effect doctrine, which excluded environmental factors dominated problem-solving theory. Singer believed that a more accurate view of such a relationship is captured in the phrase, producer-product. Ackoff [7] provides the following example to illustrate this distinction. Acorns do not cause oaks. They are necessary for oaks, but they are not sufficient. An acorn thrown into a lake for instance does not yield an oak. Obviously, the environment cannot be excluded from this scenario. Moreover, according to Ackoff [7], Singer's outlook "made it possible to look at systems teleologically, in an output-oriented way, rather than deterministically, in an input-oriented way."

Objective teleology treats functional characteristics of systems as observable properties of the system's behavior [19]. The focus of the Systems Age is on teleological - goal-seeking and purposeful -- systems, not machines (or human beings considered to be machines). Churchman [20] characterized design as a creative act which attempts to estimate how alternative sets of behavior patterns would serve specific sets of goals. The doctrine of teleology in systems thinking developed out of one of the traditional models of inquiring systems, Aristotelian teleological Weltanschauung [20]. Aristotelian teleological imagery holds that elements of nature are taken to be purposeful entities. Each part, therefore, seeks specified goals. In addition, each part in a system is conceived as having a number of choices at its disposal, and it selects its choices to pursue the goals appropriate to it. [3]

Idealized design springs from Aristotelian teleological imagery. This worldview accepts one's ability to create an idealized future. The future is not already written. One can decide to pursue different goals and therefore make different choices that will affect the future. Per Ackoff [7], this doctrine is especially relevant to organizations. When we focus on organizations we are concerned with three levels of purpose: the purposes of the system, of its parts, and of the system of which it is a part, the supra system. The Singerian inquiring system, upon which theorists like Ackoff and Churchman built their ideas, holds that design cannot simply follow disciplinary lines, but also has to include variables from the social sciences, ethics, and aesthetics. Moreover, because the inquiry is needed to create cooperation, and cooperation to create inquiry, the design of an inquiring system ought to grasp the essence of the creative energy in every participant of the organization. The design approach to planning is thus participative, the social product of an open interaction in a wide variety of subjective value judgments.

The Process of Interactive Planning

Interactive planning is not an act but a process involving six phases that form a cycle that has no arbitrary end point in time, but continues to adapt to changing internal and external conditions. The phases interact and can be initiated in any order, but must be completed together. [1–3,12].



1. Formulating the mess (situational analysis). Determine how the organization could destroy itself if it continues behaving as it is currently, failing to adapt to predictable aspects of a changing environment.
2. Ends planning. Determine what the organization would like to be and identify gaps between this vision and current reality. The remainder of the planning process seeks to close these gaps.
3. Means planning. Determine what should be done to close the gaps; select the courses of action, practices, projects, programs, and policies that should be implemented.
4. Resource planning. Examine requirements of resources, facilities and equipment; materials, energy, and services; personnel; money; and information, knowledge, understanding, and wisdom.
5. Design of implementation. Identify who should do what and when it should be completed.
6. Design of controls. Determine how to monitor these assignments and schedules and to adjust for failures to meet the schedules or meet expectations.

Contrary to conventional retrospective planning, interactive planning is prospective. In the former, planners identify and remove deficiencies based upon past performance of existing system components. Getting rid of what one does not want is not equivalent to getting what one wants; in fact, what results may be worse than the deficiency removed. Contingency planning treats assumed possible futures in the design process. Every issue is addressed systemically, taking into account all the relevant interactions within the system and between the system and its environment. No improvement in a part's performance is planned unless it produces a demonstrable improvement in the performance of the whole system. Interactive Planning is not a description of an ideal system, but of an ideal-seeking system. The process of designing an ideal-seeking social system usually brings about the following results: [1,2]

1. It facilitates the direct involvement of a large number of system stakeholders. No special skills are required because no one is an expert on what ought to be; all value-based opinions are equally relevant. The process encourages thoughtful attitudes and opinions and provides an opportunity to put them into operation.
2. Agreement tends to emerge among participants and other stakeholders. Within an

organization, disagreements often arise with respect to means, not ends. The idealized design focuses on ends, not means, and can incorporate tests of alternative means to reduce conflicts and disagreements.

3. The idealization process forces those engaged to formulate explicitly their conception of organizational objectives. This opens their conceptions to examination by others thereby facilitating progressive reformulation of the objectives as well as the development of consensus.
4. The idealized design aims to promote creativity; it encourages participants to become conscious of self-imposed constraints making it easier to remove them. It also forces a reexamination of externally imposed constraints that are usually accepted passively. Ways of removing or evading them are explored, often successfully. (Ackoff & Vergara, 1981)
5. The process reveals that system designs and plans, each of whose elements appear to be unfeasible when considered separately, can become feasible when considered collectively.

Case Study: Applications of Systems Thinking and Design Methodologies toward Emergent Self-Governance Models

The Graduate and Professional Student Assembly (GAPSA) at the University of Pennsylvania anticipated a drop in stakeholder engagement as it sought to redesign purpose, practices, beliefs, and values on its tenth anniversary of unified student self-governance. Partnering with the Organizational Dynamics program at the University, GAPSA sponsored a translational consulting workgroup and parallel systems thinking course, "Applications of Systems Thinking and Design Methodologies: Emergent Governance Models" to formulate a system of problems and opportunities as it related to GAPSA performance. Participants from a cross-section of the multiplicity of Ph.D. and professional disciplines across twelve graduate schools were invited to apply interactive planning as a meta-framework and different techniques and tools from other systems thinking approaches to address this challenge.

My sincere gratitude goes to Paul Welfer, my colleague, for his contribution to preparing the case study. I consider him as the architect for the project. His contribution to teaching the class and *His leadership*, intellect, and energy-infused every aspect of this *endeavor*.

The project utilized a multifaceted methodological approach. Dave Snowden's Cynefin framework and situational awareness model were used to better understand the context for decision making and the nature of the challenge. Ackoff's interactive planning was applied as the meta-methodology along with an ensemble of systems and design approaches. These included Michael C. Jackson's creative holism and critical systems practice, Peter Checkland's soft systems methodology, Jay Forrester's system dynamics, Stafford Beer's viable system model, and Michel E. Porter's five forces. Using hassle map, influence diagram, stakeholder engagement, and other systems thinking tools, the challenge was reframed and validated through crowdsourcing from engagement to one of relevance to users: the diverse 13,000 graduate student community.

Facilitators and user participants identified a broader stakeholder community of students, prospects, alumni, faculty, staff, and trustees within the large containing system. The organization was challenged to ask, "What will happen to GAPSA if it were to continue without change in the same environment?" Through mess formulation, the hypothesis emerged that GAPSA's relevance to the Penn experience is diminishing. Through discovery and mapping of broken feedback loops, identifying KPIs of declining participation, deteriorating representation, and stagnating advocacy, a system of problems and opportunities emerged, suggesting impeding systemic properties that could be dissolved through a focus on interrelationships and interactions rather than component parts or structures alone.

System analysis exposed opportunities for improved executive continuity of business models, recognizing the transience of the community demarcated by the length of the graduate degree program. Stakeholder insights disclosed administrative dominance crowding out student influence and interest in the system. Funding models revealed a need for greater transparency, simplicity, and stability to foster stronger linkage between community members, resources, and decision-making toward greater participation and legitimacy of self-governance. Recognition of awareness, engagement, and participation limitations drove the team towards a system designed by users.

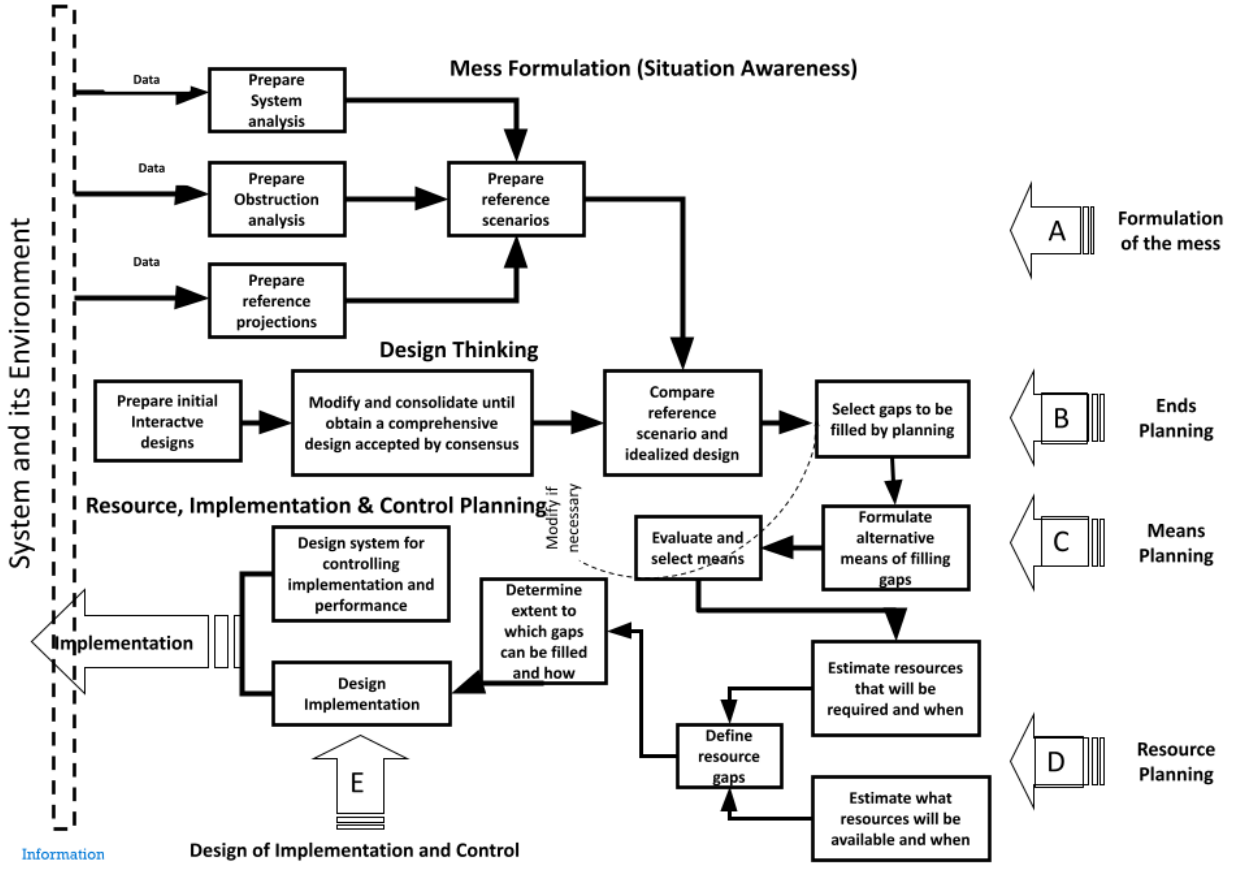
The project reformulated vision, mission statement, and value propositions for the organization focused on stakeholder interrelationships through an interdependent integrated approach to sustainable student-centered culture and positive student experience. Stakeholder development of a honeycomb model continuously realigns vision, purpose, values, resources, hopes, and goals toward renewal and sustainability. The resulting path and outcome produced: (1) a mindset shift from predominantly analytic to synthetic-based solutions informed by the complex domain, (2) true action-learning and emergent design by users, (3) renewal resolution integrating double-loop learning and feedback through a permanent sustainability system structure and function, (4) user demand satisfaction and co-creation, and (5) leadership development pathways through the emergent interactive systems thinking and design approach. Embarking on the project changed the system, creating user awareness, enthusiasm, and satisfaction through higher engagement rates. The case study, therefore, demonstrates a successful integrated system of a systems approach that has driven the learning that users continue to apply every day for the growth and development of GAPSA as the organization design moves from Idealization to Realization through iterative emergence.

To see the presentation, please click on: https://jdc.jefferson.edu/sbpresentations/1/

Advantages of the Interactive Planning Methodology

Interactive Planning promotes participation from all stakeholders, giving them an opportunity to create their own future. By bringing multiple perspectives to bear on a decision, it creates consensus around the vision, enriches the process, and generates buy-in from participants. Interactive Planning draws upon the entirety of an organization's knowledge base, revealing pieces that might already be in place and accelerating the process of implementation. Equally important, however, is the lasting impact interactive planning can have on an organization. It produces a radical change that is sustained and lasting (transformation) by involving all the stakeholders in the planning process and by changing their understanding of the organization and its environment. It facilitates employee empowerment, and

increases morale and productivity, acknowledges the creativity and out-of-the-box thinking, and encourages flexibility. Lastly, interactive planning propels an organization in a more proactive direction, improving the dynamics among stakeholders and engendering an atmosphere of cooperation and common purpose. [21,22]



The Limitations and Potentialities of Interactive Planning

Three restrictive patterns can impede the successful implementation of interactive planning. First is the time commitment. Interactive planning is a structured set of facilitated activities for groups of participants, who work *together* to explore a problem and its solutions. As such, participants must allot significant amounts of overlapping time to a slow, phased approach. Since interactive planning is an iterative process, cutting the time to minimum compromises the process effectiveness, resulting in less than satisfactory results. The second limitation is interactive planning's dependence on high-quality facilitation. Facilitators synchronize and help group discussions and activities during an interactive workshop. It is of paramount importance that facilitators know how to moderate and are familiar with the objectives and feasibilities of the activities that are scheduled. They keep discussions on time and remind participants to note down all their points, sometimes actually doing this for them whilst they are speaking. In short, a competent facilitator can be the difference between productivity and chaos. The third limitation

is the need for genuine commitment by management to a democratic process throughout the planning cycle. Successful participation requires managers to approach stakeholder involvement with an open mind. They must be open to new ideas and alternatives in order for interactive planning to work. Although the management may not agree with every idea or suggestion stakeholders make, how those ideas are received is critical to the success of interactive planning.

Despite these limitations, interactive planning is entering a new era of utility and vitality in a technologically interconnected world. With the advancement in social media technologies, and specifically in collaborative technology platforms, the potential exists to involve vast numbers of participants. Crowdsourcing to tap the wisdom of the crowd is already being utilized in planning activities. Additionally, new technologies allow cheaper and faster-distributed participation as well as better ways of capturing and documenting the outputs of the ideation phase of the planning. Artificial intelligence and machine learning have the potential to analyze and synthesize the big data generated by the output of the interactive planning sessions. The brainchild of Russell Ackoff and his colleagues has lost none of its value over the past 40 years and appears poised to live on as a fruitful part of successful organizational management in the decades to come.

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